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Los Alamos National Laboratory

Utah Valley University Recruiting

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Los Alamos New Mexico

Main Street

Overview of Los Alamos National Laboratory

“Delivering science and technology to protect our nation and promote world stability”

LANL Facts

- ***11,000 employees***
- ***36 square miles***
  268 miles of roads
- ***47 technical areas***
- ***1,280 buildings***
- ***11 nuclear facilities***
- ***$2.4 billion annual budget***

Business Innovation Directorate (ADBI)

Associate Director, Acting
Steve Renfro

Deputy Associate Director
Elaine Santantonio

Deputy Associate Director
Charlotte Lindsey

Software & Applications Engineering (SAE)	Acquisition Services Management (ASM)	Network & Infrastructure Engineering (NIE)	eXperience IT (XIT)	Service Innovation (SI)	Human Resources (HR)

This is Network and Infrastructure Engineering (NIE)

NIE provides a robust and powerful infrastructure, allowing science and mission to work securely and seamlessly; within the Laboratory, across the Internet, and around the world. This is accomplished through:

- ***Connectivity***
- ***Communication***
- ***Collaboration***

NIE Connects Technology To Mission

Where We've Been

Technology Evolution Has Enabled LANL Mission

NIE Connects Technology to Mission

Where We Are

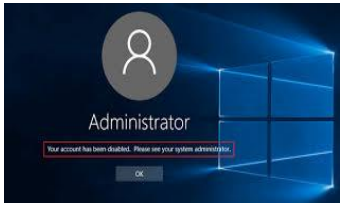
Infrastructure Services (NIE-IS)

Composes the unseen skeleton that underlies all Laboratory network infrastructure, without which the Laboratory could neither communicate nor collaborate electronically through the following services:

- ***Identity management and verification***
- ***Remote access***
- ***Encryption***
- ***Communication in and out of our networks,***
- ***Web services infrastructure***
- ***Email relay infrastructure***
- ***Virtual private cloud***

Core Services (NIE-CS)

24/7 Service



Exchange Server 2016

Maintains the information nervous system, enabling Laboratory customers to communicate internally and externally with confidence through the following customer focused services:

- ***Network Operations Center (NOC) provides continual monitoring and remediation of network problems***
- ***Core business processing support through Production Control***
- ***Datacenter management***
- ***Collaboration through Exchange based email and Skype for Business***
- ***Server access and administration***
- ***mobile device management***

Configuration and Development Services (NIE-CDS)

Provides proactive immunization against external and internal threats, a data lake of system information, and enables real-time feedback to assure the security of the LANL network through the following services:

- ***Implements and maintains standards based security settings of computers to address the ever-evolving threat matrix***
- ***Quality assurance testing***
- ***Vulnerability patching, and software distribution***

Telecommunication Services (NIE-TS)

Every phone call and LANL mobile device reflects the seamless work of the group as it enables the organizations to communicate throughout the world through the following services:

- ***Telephony systems***
- ***Video teleconferencing***
- ***Mobile devices – cell phone, pager, smartphone***
- ***Wireless networks, including radio services***
- ***Infrastructure construction – project design and oversight***

Engineering Security Services (NIE-ESS)

Provides exemplary cyber event prevention, detection, and response capability, that benefits all of the DOE/NNSA complex through the following services:

- ***Nationally recognized Cyber security incident response team (CSIRT) responding to real-time cyber events***
- ***Red Team network penetration testing***
- ***Firewall and cyber appliance customization to address continually evolving threats***
- ***In-depth protection, detection, alert, and logging systems defend against and identify external and internal threats***

COMSEC SYSTEMS

splunk>

tenable network security

paloalto NETWORKS®

Where We Are Going

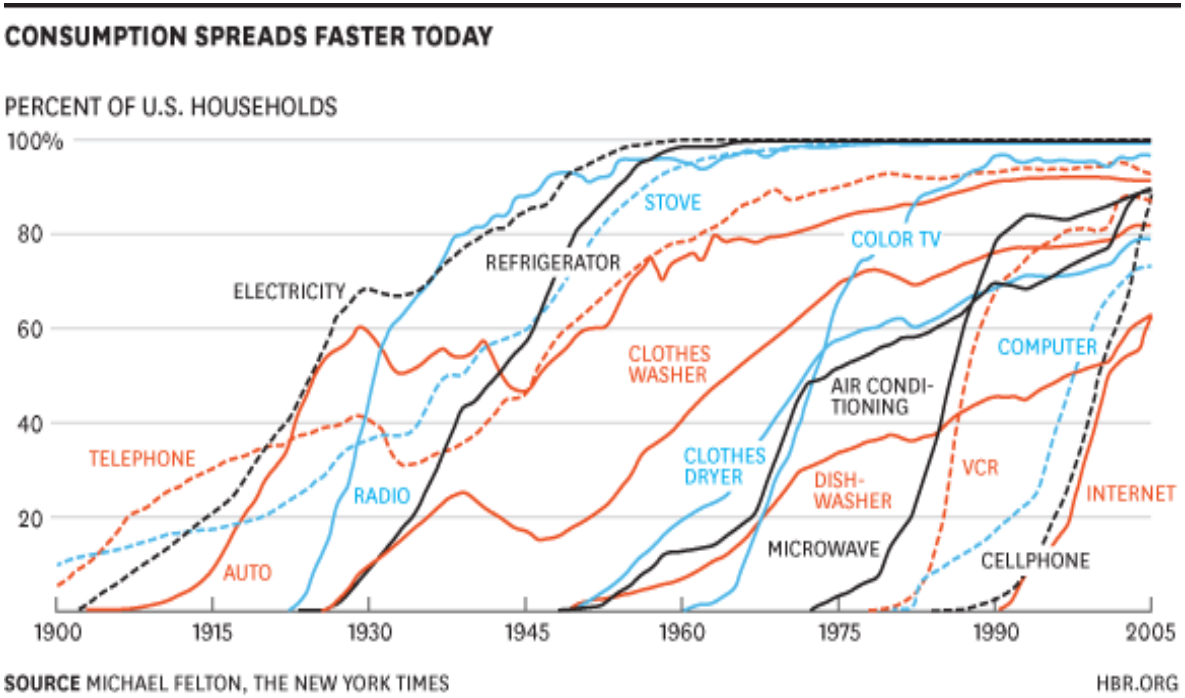
We Must Prepare For Disruptive Technology

NIE

"A disruptive technology is one that displaces an established technology and shakes up the industry or a ground-breaking product that creates a completely new industry."

- Computer Fundamentals Glossary

Rate of Technology Adoption

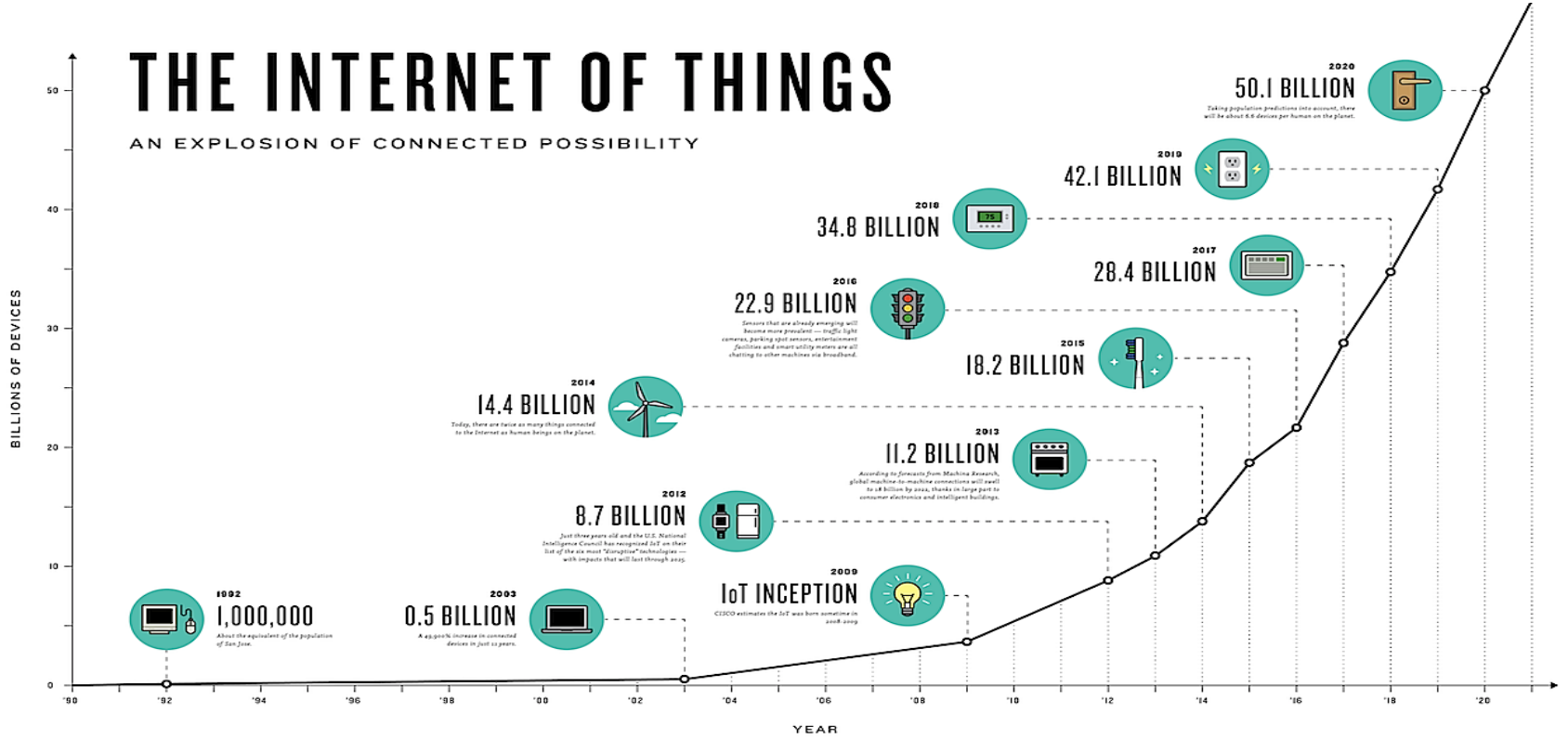


- It took decades for the telephone to reach 50% of households, beginning before 1900
- It took five years or less for cellphones to accomplish the same penetration in 1990

The introduction and adoption of new technology is accelerating exponentially

Examples of Disruptive Technology

of connected devices = disruption = opportunity



Importance Of Embracing New Technology

NIE

- Adapt or be left behind
- NIE must continue to remember that our role is to “connect technology to mission”
- Innovation in information technology is a given
- We must be proactive and anticipatory in the adoption of new technology

Disruptive Technologies To Watch – (Network World)

- **IoT (internet of things), M2M (machine to machine) systems and telematics**
  - IoT – by 2020 more than half of new business processes will involve IoT is some manner
  - M2M – Caution here, as this has led to DDoS attacks recently
  - Telematics - **Telematics** is an interdisciplinary field that encompasses:
    - the technology of sending, receiving and storing information via telecommunication devices in conjunction with effecting control on remote objects
    - the integrated use of telecommunications and informatics for application in vehicles and with control of vehicles on the move
    - global navigation satellite system technology integrated with computers and mobile communications technology in automotive navigation systems
    - (most narrowly) the use of such systems within road vehicles, also called vehicle telematics

Even more …

- **Artificial Intelligence**
  - Already has been discussed and researched for years
  - IBM Watson is a clear step ahead
  - Stanford University study says that by 2030 AI will have a large impact in several areas including:
    - Aerial deliver drones
    - Autonomous vehicles
    - Healthcare
  - Other studies see the benefit in predictive analytics and big data
  - ***Needed to analyze and respond to cyber events***

Finally …

- **Next-generation Wi-Fi**
  - An emerging wireless protocol known as Wi-Fi HaLow, is based on the still developing IEEE 802.11ah standard uses the 900mHZ spectrum
  - First gear expected to be certified in 2018 and doubles the range of standard Wi-Fi, and breaks through obstacles like walls
  - Can support thousands of devices per access point
  - IoT and wearable technology will leverage this
  - This will doubtless raise cyber security concerns
  - LANL will need to tread very carefully in this space

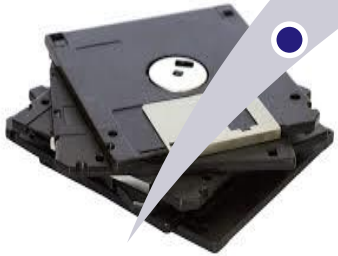
Strategic Roadmap – 3 to 5 years

Network Switch Project | VoIP Project | MFA Project | Network and Cyber Technology Refresh

Continue to position appropriate NIE services to migrate to external cloud in a secure manner

Proactively recruit/hire diverse workforce that can embrace change and disruptive technology

Recalibrate NIE metrics and analyze operations



Prepare for contract transition. Identify and retire obsolete technologies/services. Embrace disruptive technologies and pilot deployments

Come Join Us!

- Our job ads are available for internships; undergrad and graduate
- Hiring fulltime positions as well
- At the Career Fair tomorrow
- Will interview for some positions on Thursday morning